



## Center in Ergonomics

Texas Engineering Experiment Station — The Texas A&M University System

***Helping industry improve its competitiveness by improving worker performance and reducing injuries and illnesses related to cumulative trauma disorders in the workplace***

### **Mission and Goals**

The mission of the Center in Ergonomics focuses on cumulative trauma disorders (CTDs). CTDs, also known as repetitive trauma disorders, are the most frequent and costly illnesses in the industrial workplace.

Goals of the Center are three-fold: to determine the root causes of cumulative trauma disorders; to identify effective interventions to combat these illnesses; and to identify emerging technologies and issues related to CTDs.

The Center seeks:

- To contribute to the technology and information base necessary to evaluate and redesign existing

workplace environments and work methods that affect CTDs, while providing leadership for the effective design of future work systems

- To provide an opportunity for industry to develop, select, and evaluate CTD research topics in response to both safety and health issues and ergonomics guidelines and standards that are being developed and proposed.

Every industrial sector can benefit from CTD research, since cumulative trauma disorders seriously affect competitiveness by decreasing productivity and increasing costs. Significant concerns exist in general manufacturing, office environments, heavy industry, transportation and logistics, data processing, and the semiconductor, food, defense, and aerospace industries.

*A National Science Foundation Industry/University Cooperative Research Center since 1995*



**An oxygen consumption measurement device measures energy expenditure while the subject performs a manual materials handling (MMH) task.**



**An electromyometer measures nerve conduction velocity and hand/fingertip thermistors measure skin temperature while a subject types on an adjustable-split keyboard.**

### Research Program

The purpose of ergonomics — fitting the work to the person — is to improve worker performance and safety. Ergonomics researchers study general principles that govern the interaction of humans with machines, materials, and working environments.

Cumulative trauma disorders are one specialty in the field of ergonomics. Carpal tunnel syndrome, a progressive and disabling disease of the hand-wrist, is the best known CTD. The most frequent and costly CTD illness, however, is low back pain, a debilitating musculoskeletal disorder.

The Center's 10-year focus is to predict injuries and illnesses by analyzing CTD risk factors. CTD risk factors can be grouped into four categories: occupational, nonoccupational, personal, and psychosocial.

The abrupt increases in injury/illness rates, health care costs, workers' compensation costs, and regulatory activity have dictated the Center's near-term research agenda and its key CTD research areas, which include—

- National Institute for Occupational Safety and Health (NIOSH) lifting guidelines energy expenditure validation

- Job rotation schedules
- Biomechanical modeling to determine cart design
- Worker physiology studies such as work hardening and thermal stress
- Standing fatigue affected by footwear and anti-fatigue devices
- Evaluation of alternate keyboards and input devices, such as split keyboards, trackballs, touch pads, etc.

The Center's Industrial Advisory Board meets twice annually to evaluate ongoing research and set research priorities. Center funding also is complemented by support from a NIOSH ergonomics training grant.

### Facilities

In addition to interdisciplinary resources available on the campus of Texas A&M University, the Center's facilities include 20,000 square feet of laboratory space. The Center is fully equipped to support research on work environment simulations, work physiology, manual materials handling, continuous lifting studies, workplace design and evaluation, psychomotor and perceptual investigations, adjustment and reconfiguration for optimal ergonomic design of computer workstations, and kinetic and kinematic data acquisition.

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